



## Evolution Lab

In this lab, you will use a computer simulation to track a population of organisms as they evolve. You will take data on the number and varieties of the organisms and graph them to show change over time and determine how two factors: MUTATION RATE and SELECTION STRENGTH affect how populations evolve.

### Instructions

1. Go to [www.biologyinmotion.com](http://www.biologyinmotion.com) and click on the link that says "evolution lab"
2. Read the introduction and the contents to learn about the imaginary creatures you will be studying and how to operate the simulator. You may also want to look at the help link.
3. Open the simulator and practice using the controls before you go on to the real simulation. Be sure to "reset" the simulator when you're finished practicing.

### The Simulations

**Simulation A** - The purpose of this simulation is to determine how the mutation rate affects the evolution of your population. You will need to run 4 trials with varying settings for mutation rate.

Print [Blank Data Tables \(doc\)](#) and collect data as you run the simulation. Create a graph using a graphing program such as excel. You will have 4 lines on your graph. The X-axis will be cycles, and the Y will be mean phenotype.

**Simulation B** - The purpose of this simulation is to determine how selection strength affects the evolution of your population. Run three trials with the selection strength at 0, and three trials with the selection strength at varying ranges. (See data table)

Fill out the data table and create a graph for simulation B.

### Analysis

Answer the following questions on a separate page, title this page "Evolution Simulation" and make sure your name is on it. You can even type it in Word if you like.

1. Describe how the simulation models natural selection (and evolution).
2. Explain HOW the mutation rate affects the evolution of your populations.  
--> Explain WHY the mutation rate affects the evolution of your populations.
3. Explain HOW altering the selection rate affects the evolution of your populations. (You may want to include an explanation of what "selection strength" means.)  
--> Explain WHY altering the selection rate affects the evolution of your populations.

**\*\*At the end of this web activity, you will have turned in the following documents:**

- Data tables
- 2 Graphs
- Analysis Questions

*Credits: Special thanks to Leif Saul, author of Biology in Motion and the creator of the Evolution Lab.*